APRIL 2008

[Draft] Environmental Assessment

MAINTENANCE DREDGING
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA

U.S. Army Corps
of Engineers
JACKSONVILLE
DISTRICT

ENVIRONMENTAL ASSESSMENT
ON
MAINTENANCE DREDGING
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA

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1 PROJECT PURPOSE AND NEED

1.1 PROJECT DESCRIPTION.

The U.S. Army Corps of Engineers (Corps), Jacksonville District, is proposing to annually maintenance dredge up to 1,500,000 cubic yards of material from the federal system of channels at Canaveral Harbor, Brevard County, Florida (see Figure 1, Project Map). Areas to be dredged include the Entrance Channel, Trident Access Channel, Trident Turning Basin, Inner Channel, Middle Turning Basin, West Access Channel, West Turning Basin, and Barge Canal. Qualifying dredged material would be placed in the designated Ocean Dredged Material Disposal Site (ODMDS). Other dredged materials would be placed at the approved Nearshore Disposal Area west of Cocoa Beach, the West Confined Disposal Facility west of the Trident Turning Basin, or the Barge Canal Disposal Area adjacent to the Barge Canal on Merritt Island. The entrance channel would be maintained at a depth of -46 ft from its seaward end to the middle of the widener and -48 ft from that point to the west side of the Trident Access Channel. The widener itself would be maintained to depths of -43 ft (Civil Works Widener) and -46 ft (Navy Widener). A settling basin north of the entrance channel and east of the Trident Access Channel would be maintained to a depth of -48 ft. The Inner Channel would be maintained to a depth of -42 ft; the first 1,800 ft of the West Access Channel to a depth of -41 ft; and the remaining West Access Channel to a depth of -33 ft. The Trident Access Channel and Trident Turning Basin would be maintained to a depth of -43 ft; the Middle Turning Basin to depths of -37 ft and -41 ft; and the West Turning Basin to a depth of -33 ft. The Barge Canal would be maintained to a depth of -14 ft along its entire length.

1.2 PROJECT NEED OR OPPORTUNITY.

Canaveral Harbor, with its system of navigation channels and jetties, interrupts the natural transport of sediment along the adjacent coastline. Suspended sand and silty material settles out within the harbor's channels forming large shoals which restrict commercial shipping and Naval activities. Annual dredging is required to maintain authorized depths, avoid navigational hazards and in the worst case scenario, closure of the harbor to deep draft vessels. The dredged material has

Figure 1. Project Map **(Click Link to See Map)**

historically contained silts and clays and, therefore, the material has been placed in approved locations offshore. Since 1991, however, maintenance material has been separated and qualifying sediments have been placed in the nearshore downdrift of the inlet. Dredged material from this project shall not be placed on the beach due to the presence of silty material. Dredged material that fails to meet the criteria for offshore or nearshore disposal shall be placed in an upland facility (Port Canaveral Inlet Management Study 1996; U.S. Army Corps of Engineers Statement of Findings 2005). As stated earlier, the Corps proposes to annually remove up to 1,500,000 cubic yards of dredged material from the project channel. This increase is based on historical maintenance dredging requirements coupled with an emerging trend of reporting material on a total quantity basis (paid and unpaid).

1.3 PROJECT AUTHORITY.

1.3.1 INITIAL AUTHORIZATION.

Construction of the entrance channel, jetties, turning basin, and barge canal with a navigation lock were authorized on 2 March 1945 by House Document 367, 77th Congress, 1st Session.

1.3.2 SUPPLEMENTAL AUTHORIZATIONS.

Maintenance of the improved channel and turning basin, enlargement of the barge canal and lock, dike relocation, construction of a channel and turning basin west of the existing turning basin were authorized on 23 October 1962 by Senate Document 140, 87th Congress, 2nd Session. The 1992 Water Resources Development Act authorized Canaveral Harbor's current project civil works depth and width.

1.4 RELATED ENVIRONMENTAL DOCUMENTS.

Other NEPA documents prepared by the Corps and related to the planned action include an Environmental Assessment (EA) on the maintenance dredging of Canaveral Harbor (1999). A separate EA (2000) was prepared for the maintenance dredging of the Canaveral Barge Canal. However, these documents did not address placement of material in upland locations north of the harbor and they do not include a discussion of currently relevant laws such as the Magnuson-Stevens Fishery Conservation and Management Act. Both documents were in need of updating, especially on the location and protection of resources in the area such as seagrass. Additional related NEPA documents include an Environmental Impact Statement (1996) on the Brevard County Shore Protection Project as well as EAs on the North Jetty Sand Tightening and Jetty Extension (2002) and the Canaveral Harbor Sand Bypass System (1993). An Environmental Impact Statement (1990) on the ODMDS was prepared by the U.S. Environmental Protection Agency.

1.5 DECISIONS TO BE MADE.

This Environmental Assessment will evaluate whether to continue maintenance dredging of Canaveral Harbor and, if so, recommend alternatives to accomplish that goal.

1.6 SCOPING AND ISSUES.

1.6.1 RELEVANT ISSUES.

The following issues were identified as relevant to the proposed action and appropriate for further evaluation: threatened and endangered species including sea turtles, right whales, West Indian manatee, smalltooth sawfish, Florida scrub jay, eastern indigo snake, and gopher tortoise; water quality; essential fish habitat (including seagrass); wildlife resources; air quality; cultural resources; aesthetics; recreation; socio economics; noise; and navigation.

1.6.2 ISSUES ELIMINATED FROM FURTHER ANALYSIS.

The proposed action is expected to have little or no impact on soils, housing, or population dynamics.

1.7 ENVIRONMENTAL COORDINATION

1.7.1 WATER QUALITY CERTIFICATION

This project would be performed in compliance with state of Florida water quality standards. In accordance with the Coastal Zone Management Act, the proposed maintenance dredging would also be reviewed by the state in order to determine if the project is consistent with the Coastal Zone Management Plan. This review is performed concurrently with the issuance of the state permit.

1.7.2 ENDANGERED SPECIES ACT- SECTION 7 COORDINATION

In accordance with Section 7 of the Endangered Species Act, the proposed work would be coordinated with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service.

2 ALTERNATIVES

The alternatives section is perhaps the most important component of this EA. It describes the no-action alternative, the proposed action, and other reasonable alternatives that were evaluated. The beneficial and adverse environmental effects of the alternatives are presented in comparative form, providing a clear basis for choice to the decisionmaker and the public. A preferred alternative was selected based on the information and analysis presented in the sections on the Affected Environment and Probable Impacts.

2.1 DESCRIPTION OF ALTERNATIVES.

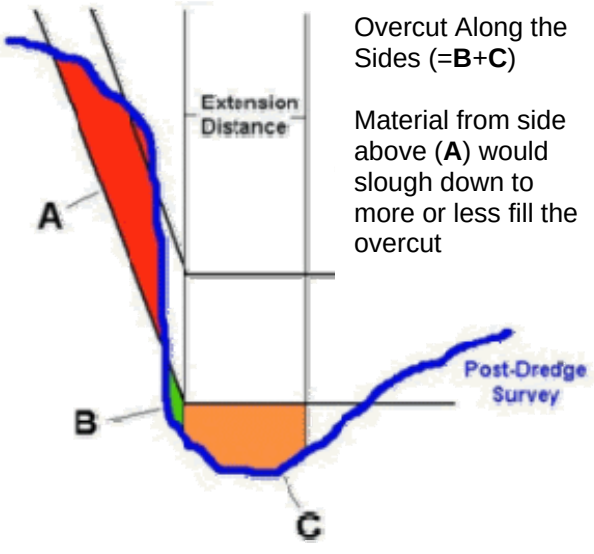
2.1.1 NO-ACTION ALTERNATIVE

Canaveral Harbor would not be maintenance dredged. This would result in increased shoaling and unsafe navigation conditions for deep draft vessels.

2.1.2 DREDGING ALTERNATIVE

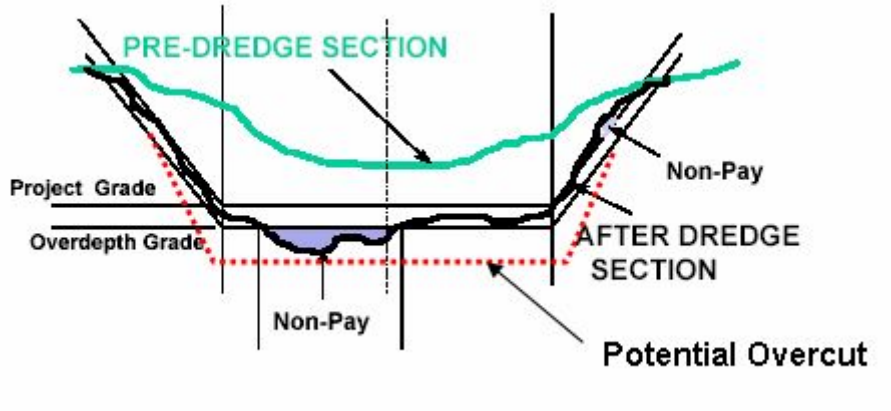
The proposed annual maintenance dredging of Canaveral Harbor would occur as planned (refer to Section 1.1 for more detail). The Corps does not normally specify the type of dredging equipment to be used. This is generally left to the dredging industry to offer the most appropriate and competitive equipment available at the time. Never-the-less, certain types of dredging equipment are normally considered more appropriate depending on the type of material, the depth of the channel, the depth of access to the disposal or placement site, the amount of material, the distance to the disposal or placement site, the wave-energy environment, etc. A more detailed description of types of dredging equipment and their characteristics can be found in Engineer Manual, EM 1110-2-5025, *Engineering and Design - Dredging and Dredged Material Disposal*. This Engineer Manual is available on the internet at http://www.usace.army.mil/publications/eng-manuals/em1110-2-5025/toc.htm.

The plans and specifications normally require dredging beyond the project depth or width. The purpose of the “required” additional dredging is to account for shoaling between dredging cycles (reduce the frequency of dredging required to maintain the project depth for navigation). In addition, the dredging contractor is allowed to go beyond the required depth. This “allowable” accounts for the inherent variability and inaccuracy of the dredging equipment (normally ±2 feet). In



Overcut Along the Sides (=**B**+**C**)

Material from side above (**A**) would slough down to more or less fill the overcut



addition, the dredge operator may practice over-cutting. An “over-cut” along the sides of the channel may be employed in anticipation of movement of material down the sides of the channel. Over-cut throughout the channel bottom may be the result of furrowing or pitting by the dredging equipment (the suction dredge’s cutterhead, the hopper dredge’s drag arms, or the clam-shell dredge’s bucket). In addition, some mixing and churning of material below the channel bottom may occur (especially with a large cutterhead). Generally, the larger the equipment, the greater the potential for over-cut and mixing of material below the “allowable” channel bottom. Some of this material may become mixed-in with the dredged material. If the characteristics of the material in the overcut and mixing profile differ from that above it, the character of the dredged material may be altered. The quantity and/or quality of material for disposal or placement may be substantially changed depending on the extent of over-depth and over-cut.

Past maintenance dredging at Canaveral Harbor has been typically performed with a clam-shell dredge although a hydraulic pipeline cutterhead suction dredge could also be used. Hopper dredges are only used at Canaveral Harbor in the event of an emergency. From 1999 through 2006, an average of 527,202 cubic yards (cy) of material was dredged from the project channel each year. The amount of material annually removed may be as much as 1,500,000 cy.

Since dredging equipment does not typically result in a perfectly smooth and even channel bottom (see discussion above); a drag bar, chain, or other item may be drug along the channel bottom to smooth down high spots and fill in low spots. This finishing technique also reduces the need for additional dredging to remove any high spots that may have been missed by the dredging equipment. It may be more cost effective to use a drag bar or other leveling device.

2.1.3 DREDGED MATERIAL PLACEMENT OPTIONS

2.1.3.1 Ocean Disposal

From 1999 through 2006, an average of 486,542 cubic yards (cy) of dredged material from Canaveral Harbor was annually placed within the approved Ocean Dredged Material Disposal Site (ODMDS) (refer to Figure I, Project Map). The amount of material varied from zero cy in 2001 to as much as 1,313,000 cy in 1999. Sediment was typically dredged with a clam-shell and placed in a bottom dumping scow for transport. The amount of dredged material annually going to the ODMDS could increase, but the manner in which it is dredged and transported is not expected to substantially change.

2.1.3.2 Nearshore Placement

Since 1991, qualifying dredged material from Canaveral Harbor has been evaluated for possible placement within the designated nearshore area (refer to Figure 1, Project Map). An average of 48,700 cy of dredged material was placed in the nearshore each year from 2002 through 2004. However, material is typically not moved to this location due to its high silt content. Sediment was dredged with a clam-shell and placed in a bottom dumping scow for transport. The amount of dredged material annually going to the nearshore area could increase, but the manner in which it is dredged and transported is not expected to substantially change.

2.1.3.3 Upland Placement

In 2000, an estimated 177,454 cy of dredged material from the Barge Canal was placed within the disposal site located on Merritt Island (refer to Figure 1, Project Map). During 2005, smaller quantities of dredged material from the turning basins, ranging from 176 to 1,562 cy, were placed in the West Confined Disposal Site immediately north of the harbor. It is expected that similar quantities would continue to be occasionally placed into these two upland locations.

2.2 PREFERRED ALTERNATIVE(S)

The preferred alternative is to perform the proposed dredging of Canaveral Harbor in order to maintain the authorized depths. All placement alternatives are considered environmentally acceptable.

2.3 ALTERNATIVES ELIMINATED FROM FURTHER EVALUATION

The only other practical alternative would be to perform the proposed dredging and place the material on the beach south of the entrance channel. This alternative has been eliminated from further evaluation because the sediment dredged from the harbor has historically failed to meet the criteria of the Florida Sand Rule for beach placement, or more specifically, the material has contained more than 10% silt. Qualifying sand from other locations is placed on area beaches as part of the Canaveral Sand Bypass Project and Brevard County Shore Protection Project.

2.4 COMPARISON OF ALTERNATIVES

Table 1 lists alternatives considered and summarizes the major features and consequences of the proposed action and alternatives. See section 4.0 Environmental Effects for a more detailed discussion of impacts of alternatives.

2.5 MITIGATION

The Corps proposes to conduct pre- and post-dredging surveys for seagrass adjacent to the Barge Canal. Appropriate measures to avoid impacting seagrass shall be implemented. In the event that unavoidable impacts occur, then mitigation shall be performed to offset the impacts.

Table 1: Summary of Direct and Indirect Impacts

ALTERNATIVE ENVIRONMENTAL FACTOR	No Action Status Quo	Dredging with Ocean Disposal	Dredging with Nearshore Placement	Dredging with Upland Placement
SEA TURTLES	No effect.	May affect, but not likely to adversely affect, with use of clam-shell or cutterhead dredge.	May affect, but not likely to adversely affect, with use of clam-shell or cutterhead dredge.	May affect, but not likely to adversely affect, with use of clam-shell or cutterhead dredge.
WEST INIDIAN MANATEE	No effect.	May affect, but not likely to adversely affect, with implementation of standard protection measures.	May affect, but not likely to adversely affect, with implementation of standard protection measures.	May affect, but not likely to adversely affect, with implementation of standard protection measures.
ATLANTIC RIGHT WHALE	No effect.	May affect, but not likely to adversely affect, with implementation of protection measures.	May affect, but not likely to adversely affect, with implementation of protection measures.	May affect, but not likely to adversely affect, with implementation of protection measures.
EASTERN INDIGO SNAKE	No effect.	No effect.	No effect.	May affect, but not likely to adversely affect, with implementation of draft protection measures.
FLORIDA SCRUB JAY	No effect.	No effect.	No effect.	Surveys would be performed prior to using Barge Canal upland placement area and measures taken to avoid or minimize impacts.
GOPHER TORTOISE	No effect.	No effect.	No effect.	Surveys would be performed prior to using upland placement areas. If necessary, tortoises would be relocated.
WATER QUALITY	No effect.	Short-term localized increase in turbidity at dredge site and ocean disposal site.	Short-term localized increase in turbidity at the dredge site and nearshore area.	Short-term localized increase in turbidity at dredge site.

ALTERNATIVE ENVIRONMENTAL FACTOR	No Action Status Quo	Dredging with Ocean Disposal	Dredging with Nearshore Placement	Dredging with Upland Placement
ESSENTIAL FISH HABITAT	No effect.	Water column habitat would be impacted during dredging and placement activities.	Water column habitat would be impacted during dredging and placement activities.	Water column habitat would be impacted during dredging. Seagrass surveys would be performed prior to and after dredging the Barge Canal. If necessary, impacts would be mitigated.
FISH AND WILDLIFE RESOURCES	No effect.	Minimal effect.	Minimal effect.	Wildlife protection measures would be implemented including monitoring for migratory birds and establishing buffer zones around active nests.
AIR QUALITY	No effect.	Minor and short-term impacts caused by dredging equipment.	Minor and short-term impacts caused by dredging equipment.	Minor and short-term impacts caused by dredging and construction equipment.
CULTURAL RESOURCES	No Historic Properties present	No Historic Properties present	No Historic Properties present	No Historic Properties present
RECREATION	Shoaling would result in minor adverse impact to recreational boaters.	Minor benefit to recreational boaters.	Minor benefit to recreational boaters.	Minor benefit to recreational boaters.
AESTHETICS	No effect.	Minor short-term adverse impact due to construction activities.	Minor short-term adverse impact due to construction activities.	Minor short-term adverse impact due to construction activities.
NOISE	No effect.	Minor and temporary adverse effect.	Minor and temporary adverse effect.	Minor and temporary adverse effect.
SOCIO ECONOMICS	Major long-term adverse impact to local, regional and statewide economies.	Major long-term benefit to local, regional and statewide economies.	Major long-term benefit to local, regional and statewide economies.	Major long-term benefit to local, regional and statewide economies.
NAVIGATION	Major long-term adverse impact to deep draft vessels, both military and commercial.	Major long-term benefit to deep draft vessels, both military and commercial.	Major long-term benefit to deep draft vessels, both military and commercial.	Major long-term benefit to deep draft vessels, both military and commercial.

3 AFFECTED ENVIRONMENT

The Affected Environment section succinctly describes the existing environmental resources of the areas that would be affected if any of the alternatives were implemented. This section describes only those environmental resources that are relevant to the decision to be made. It does not describe the entire existing environment, but only those environmental resources that would affect or that would be affected by the alternatives if they were implemented. This section, in conjunction with the description of the "no-action" alternative forms the base line conditions for determining the environmental impacts of the proposed action and reasonable alternatives.

3.1 GENERAL ENVIRONMENTAL SETTING

3.1.1 AREA TO BE DREDGED

Canaveral Harbor is located in Brevard County on the east-central coast of Florida (refer to Figure 1). The harbor's federally maintained system of channels serves Port Canaveral, the U.S. Navy's Trident Submarine Base, as well as Cape Canaveral Air Force Station and NASA. All of the harbor's channels, including the entrance channel, were constructed through a barrier island. Access from the harbor to the Barge Canal, which is located within the Banana River, is provided via the Canaveral Lock. The Banana River is bounded on the west by Merritt Island, which is separated from the mainland by the Indian River. The Banana and Indian Rivers are shallow, tidal lagoons and are considered to be extremely biologically diverse (Swain 1995; Swain 1996). Cape Canaveral Air Force Station borders the north side and private development is found along the south side of the harbor. Portions of the air force station remain in a natural state and are relatively undisturbed.

3.1.2 OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)

The Canaveral ODMDS is a 2 nautical mile (nmi) by 2 nmi square centered at the geographic coordinates 28 18'44"N latitude and 30 31'00"W longitude (NAD 27) or state plane coordinates 1446468 N and 655198 E (NAD 27) (refer to Figure 1). This open-ocean site lies within the Canaveral Bight on the shallow continental shelf, and is centered 4.5 nmi offshore of Cocoa Beach. It has a depth range of 47 feet to 55 feet (US Environmental Protection Agency 2001).

3.1.3 NEARSHORE PLACEMENT AREA

The Nearshore Placement Area is located approximately 1,100 feet offshore of Cocoa Beach, and lies between Florida Department of Environmental Protection DNR monuments R-28 and R-38 (refer to Figure 1). It is approximately 9,500 feet by 1,400 feet, and 305 acres in size. Depths of the site range between 20 and 26 feet.

3.1.4 UPLAND PLACEMENT SITES

The Canaveral Barge Canal disposal site is located on Merritt Island just north of the canal (refer to Figure 1). It is approximately 2,900 feet by 470 feet, and 31 acres in size. The Merritt Island National Wildlife Refuge lies adjacent to this site. The West Disposal Site is located immediately north of Canaveral Harbor (refer to Figure 1). It is an irregularly shaped site and approximately 56 acres in size. As stated earlier, this site is surrounded by Cape Canaveral Air Force Station portions of which remain in a natural state. Both disposal sites can be described as contained (diked), disturbed uplands, and support a mix of vegetation including invasive exotics, especially Brazilian pepper (*Schinus terebinthifolius*).

3.2 GEOLOGY

3.2.1 AREA TO BE DREDGED

Bottom substrates within the Entrance Channel are comprised of shoal deposits that have formed since the area was last dredged. Historically, these shoals have consisted primarily of sandy-silt and clay, with occasional thin layers of silty/clayey fine quartz sands and a trace of shell. Like the Entrance Channel, the Inner Channel is comprised of shoal deposits that have also formed since the area was last dredged. These shoals have consisted of silt, clay, poorly-graded fine quartz sand, and silty-sand with trace amounts of shell. The Turning Basins consist of soft to firm silts, fine to medium poorly-graded silty quartz sands, occasional soft thin clay layers, and a trace of shell. The West Access Channel consists of soft to firm silts, clays, and fine to medium poorly-graded silty-quartz sands. This portion of the project generally well exceeds 10% silt, and per the Florida Sand Rule is not suitable for beach placement. Pockets of material may contain 10-20% silt and therefore are considered suitable for nearshore placement (Corps 2005).

The Canaveral Barge Canal is thought to contain soft to firm silts, clays, and fine to medium poorly-graded silty-quartz sands. Silt content most likely exceeds 20%. Sampling of the canal is scheduled for 2008.

3.2.2 OCEAN DREDGED MATERIAL DISPOSAL SITE (ODMDS)

The ODMDS has a generally smooth bottom comprised of unconsolidated sediments. Samples taken from this site had a sand-size texture that was predominated by fine-grained sand with varying percentages of silt and clay. The sand-sized fraction was greater than 80% in all of the samples collected (US Environmental Protection Agency 1990).

3.2.3 NEARSHORE PLACEMENT AREA

The regional geology of the nearshore area can be generalized as unconsolidated, fine marine sediments (Field and Duane 1974) that were deposited under relatively low energy conditions created in the lee of Cape Canaveral (Meisburger and Duane 1971). Ferland and Weishar (1984) show modern clays, silts, and fine sands in the area adjacent to Cocoa Beach. More recent information contained within the state of Florida

permit application for the Canaveral Sand Bypass Project also indicates that this area has a bottom substrate consisting of unconsolidated sediment.

3.2.4 UPLAND PLACEMENT SITES

The West Disposal Site was built on Palm Beach sand, which is a nearly level and gently sloping excessively drained soil on dune-like ridges that roughly parallel the Atlantic Ocean. Other soils may have included smoothed quartzipsamments, which are nearly level to steep sandy soils that have been reworked and shaped by earthmoving equipment (USDA SCS 1974). The Canaveral Barge Canal Disposal Site was built on the following soil types: Paola fine sand, an excessively drained soil on ridges; Orsino fine sand, a nearly level moderately well drained sandy soil on moderately low ridges and between high ridges and poorly drained areas; Immokalee sand, a nearly level, poorly drained sandy soil in broad areas in the flatwoods, on low ridges between sloughs, and in low, narrow areas between sand ridges and lakes and ponds; St. Johns soils, found in sloughs, poorly defined drainageways, and shallow intermittent ponds in the flatwoods; Myakka sand, a nearly level, poorly drained sandy soil in broad areas in the flatwoods and in areas between sand ridges and sloughs and ponds; and Canaveral complex, this complex consists of nearly level and gently sloping soils that are mixtures of sand and shell fragments (USDA SCS 1974).

3.3 THREATENED AND ENDANGERED SPECIES

Threatened and Endangered species that may occur in the Canaveral Harbor area, and that may be affected by the proposed work, can be found in Table 2.

Table 2. Status of Listed Species that May Occur Within the Project Area.

Species	***State Listing****	***Federal Listing****
Green Sea Turtle	LE	LE
Loggerhead Sea Turtle	LT	LT
Leatherback Sea Turtle	LE	LE
Kemp's Ridley Sea Turtle	LE	LE
West Indian Manatee	LE	LE
Atlantic Right Whale	LE	LE
Gopher Tortoise	LT	None
Florida Scrub Jay	LT	LT
Eastern Indigo Snake	LT	LT

* LE=Endangered and LT=Threatened

3.3.1 SEA TURTLES

Surveys and radio tracking studies indicate that sea turtles, especially loggerheads (*Caretta caretta*) and greens (*Chelonia mydas*), are attracted to and seek refuge at the Cape Canaveral entrance channel, particularly during the winter (Butler *et al.,* 1987). The Canaveral channel is also unique in that it contains one of the largest known aggregations of subadult loggerhead turtles in the world (Richardson 1980). In addition to these research studies, the Corps has occasionally used a hopper dredge to remove dangerous shoals from Canaveral Harbor which typically form due to storm events. This type of action is taken only when a true emergency arises and the shoals pose a significant threat to deep draft vessels. Coordination with the National Marine Fisheries Service is also required. Under such circumstances, sea turtles have been captured using a trawl net and relocated in order to reduce the chance of being taken by the hopper dredge. In February 2002, a total of 69 sea turtles were successfully caught with a trawl net, tagged, and released approximately 3 miles from shore (Bargo and Parks 2002). During September-October 2004, a total of 124 sea turtles with four recaptures were caught, tagged, and safely released 3-5 miles east-southeast of the project area (90 loggerheads, 30 green) (Bargo 2004). The number of sea turtles relocated during these two projects also demonstrates the high abundance of sea turtles in the vicinity of the Canaveral Harbor entrance channel. Area beaches are known to support nesting populations of greens and loggerheads. The leatherback (*Dermochelys coriacea*) and Kemp's ridley (*Lepidochelys kempii*) sea turtles are known to occur in the vicinity of the project area as well. The proposed work does not overlap any designated critical habitat for these species.

3.3.2 WEST INDIAN MANATEE

The Corps operates a lock facility at the western end of Canaveral Harbor that allows vessel traffic to access the Banana River through the port, and vice versa. Sighting data collected from 1997 through 2006 (Table 2), shows that the facility is heavily used by West Indian manatees (*Trichechus manatus*), with the number of transiting animals declining in December and a definite lull during January and February.

Table 3. Canaveral Lock Manatee Sightings, 1997-2006

	Year									
	1997	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
January	0	78	84	16	5	8	1	24	10	42
February	0	8	234	19	36	126	15	54	10	143
March	0	108	168	428	143	84	277	57	39	315
April	0	256	650	655	385	369	500	308	331	597
May	0	128	741	560	426	232	571	616	598	920

	Year									
	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
June	0	222	702	392	424	349	411	658	388	1031
July	0	108	805	464	539	355	544	657	446	844
August	0	106	663	557	618	304	626	578	596	0
September	0	118	555	319	299	222	452	188	544	0
October	424	52	623	654	299	290	610	414	0	687
November	167	73	338	426	46	335	324	177	0	320
December	190	189	115	100	72	59	101	79	0	405

The project area lies within designated critical habitat for this species, and the Canaveral Barge Canal has been designated a Federal Manatee Refuge by the U.S. Fish and Wildlife Service.

3.3.3 NORTHERN RIGHT WHALE

Northern right whales (*Eubalaena glacialis*) are known to occur in the vicinity of Cape Canaveral during the winter calving season (NMFS 2008). At the time of this writing, there had been two recorded sightings off of the Cape in 2007 and 2008. The project area also lies within designated critical habitat for this species. Sighting locations can be found at the following website:

http://sero.nmfs.noaa.gov/pr/pdf/2008%20sightingsJan2708.pdf

3.3.4 SMALLTOOTH SAWFISH

The smalltooth sawfish (*Pristis pectinata*) may occur in the vicinity of the project. Densities of this species in these waters may be as low as 0.001-0.099 fish/square km (Simpfendorfer and Wiley 2006).

3.3.5 EASTERN INDIGO SNAKE

The Eastern indigo snake (*Drymarchon couperais*) may occur at the Canaveral Barge Canal Disposal Site and, while less likely, the West Disposal Site. These two locations provide the type of habitat that is known to support this species, i.e. deep sandy soils, appropriate vegetation, prey species, and gopher tortoise burrows. Both sites are adjacent to natural areas that do have indigo snake populations.

3.3.6 FLORIDA SCRUB-JAY

The Florida scrub-jay (*Aphelocoma coerulescens*) has been observed within the vicinity of the Canaveral Barge Canal Disposal Site. In 1999-2000, surveys determined that scrub-jays were using lands immediately adjacent to the northern and eastern sides of the site with occasional forays onto the dike and northern edge of the interior. Based on the survey data, three families of scrub-jays, containing two to four individuals, were actively using small portions of the site. Using the base of the dike as the project boundary, these groups appeared to be foraging on approximately 2.2 acres of the

property. Most scrub-jay activity was observed in areas north and northeast of the disposal site (Corps 2000).

3.3.7 GOPHER TORTOISE

The West Disposal Site may support up to 20 gopher tortoises (*Gopherus polyphemus*) (Patrick Air Force Base, 2007, personal communication). Surveys of the Canaveral Barge Canal Disposal Site (1999-2000) found a total of 144 burrows on the property. The dike supported the majority of the population with 128 burrows while the western portion of the interior had 16 burrows. Tortoises that could be adversely impacted by construction were relocated from the site prior to the last dredging event in 2000 (Corps 2000).

3.4 WATER QUALITY

3.4.1 WATER USE CLASSIFICATION

Waters within the proposed dredging area have been designated by the state of Florida as Class III - Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife. The Banana River Aquatic Preserve, established by the state of Florida in 1970, lies to the south of the Canaveral Barge Canal. Additional information on this preserve, including a map, can be found at the following website: http://www.dep.state.fl.us/coastal/sites/banana/

3.4.2 SEDIMENT ANALYSIS

Analysis indicates that dredged material from the Entrance Channel, West Turning Basin, a portion of the Middle Turning Basin, and a portion of the Trident Basin is suitable for placement within the approved Ocean Dredged Material Disposal Site. However, samples from the Trident Dock area failed to pass bioassay tests and, therefore, do not qualify for ocean disposal (Corps 2007). Sediment from the Canaveral Barge Canal has not been tested. Additional information on sediment analysis of the Entrance Channel and Trident Basin can be found at the following website: http://planning.saj.usace.army.mil/envdocs_A-D/Brevard/Canaveral_Harbor/pdf_files/CanaveralReportFinal.pdf

3.5 ESSENTIAL FISH HABITAT

Pursuant to the Magnuson-Stevens Fishery Conservation and Management Act of 1996, waters and substrate within the project area have been identified as Essential Fish Habitat (EFH) by the South Atlantic Fishery Management Council (1998). EFH is defined as those waters and substrate necessary for fish to spawn, breed, feed, or grow to maturity. Estuarine/inshore EFH within the footprint of the project channel consists of estuarine water column with an unconsolidated substrate. There is also a wide band of seagrass, roughly 200 to 400 m wide mapped along the western shoreline of Banana River north of the Barge Canal (Robert Virnstein, St. Johns Water Management District, personal communication, 2008). Marine/offshore EFH within the boundaries of the Nearshore Placement Area consists of water column with an unconsolidated substrate. Species managed by the National Marine Fisheries Service that may occur within the

project channel and Nearshore Placement Area can be found in Table 4, and possible prey species in Table 5. Information on the marine resources of the ODMDS can be found in the Environmental Impact Statement prepared by the U.S. Environmental Protection Agency.

Table 4. Federally Managed Species of Fish that May Occur within the Project Area.

Species	**Life Stage**	**Substrate Preference***	
		Unconsolidated Sediment	**Seagrass**
Brown shrimp *Peneus aztecus*	A, J, L	A, J, L	J, L
Pink shrimp *Peneus duoratum*	A, J	A, J	J
White Shrimp *Peneus setiferus*	A, J	A, J	J, L
Black seabass *Centropristis ocyurus*	A, J	A, J	
Gag *Mycteroperca microlepis*	A, J	A, J	
Cobia *Rachycentron canadum*	J	J	
Mutton snapper *Lutjanus analis*	J	J	J
Gray snapper *Lutjanus griseus*	A, J, L	A, J, L	A, J, L
Lane snapper *Lutjanus synagris*	A, J	A, J	J
Yellowtail snapper *Lutjanus chrysurus*	J	J	J
White grunt *Haemulon plumieri*	A, J	A, J	A, J
Sheepshead *Archosargus probatocephalus*	A, J, L	A, J	J, L
Red drum *Sciaenops ocellatus*	A, J, L	A, J, L	J, L
Hogfish *Lachnolaimus maximus*	J	J	J
Spanish mackerel *Scomberomorus maculatus*	A, J	A, J	
Black drum *Pogonias cromis*	A, J	A, J	
Southern flounder *Paralichthys lethostigma*	A, J	A, J	J

Table 5. Prey Species that May Occur within the Project Area.

Species	Life Stage	Substrate Preference*	
		Unconsolidated Sediment	Seagrass
Bay anchovy *Anchoa mitchilli*	A, J, L	A, J, L	L
Sheepshead minnow *Cyprindon variegatus*	A, J, L	A, J, L	
Atlantic menhaden *Brevoortia tyrannus*	A, J, L	A	J, L
Bay scallop *Argopecten irradians*	A, J, L	A, J	A, J, L
Atlantic rangia *Rangia cuneata*	A, J, L	A, J, L	
Quahog *Mercenaria sp.*	A, J	A, J	
Grass shrimp *Palaemonetes pugio*	A, J		A, J
Striped mullet *Mugil cephalus*	A, J	A, J	A, J
Spot *Leiostomus xanthurus*	A, J	A	J
Atlantic croaker *Micropogonias undulates*	A, J	A, J	
Silversides *Menidia sp.*	A, J, L	A, J, L	A, J, L
American eel *Anguilla rostrata*	A, J, L	J, L	A, J, L

Source: South Atlantic Fishery Management Council 1998; Florida Museum of Natural History-Ichthyology website 2008.

*Substrate preference, unconsolidated sediment and seagrass habitats occur in or near the project area. A=adult; J=juvenile; L=larvae

3.6 FISH AND WILDLIFE RESOURCES

Marine life common to east-central Florida can be found within the project channel and Nearshore Placement Area. Sub-tidal oysterbeds do not occur within the project channel due to regular maintenance dredging. However, oysters can be found on pilings and other hard surfaces within the harbor. Other macroinvertebrates commonly found in soft-bottom estuarine habitat within Florida include annelids, a variety of mollusks besides oysters, arthropods, sponges and polyps (Hoffman and Olsen 1982).

The West Disposal and Canaveral Barge Canal Disposal Sites are disturbed upland areas dominated by exotic invasive plant species, most notably Brazilian pepper. However, some species of migratory birds, especially common passerines, are likely to nest on these properties. Colonial nesting species, such as wading birds or terns, have not been observed at these locations. However, a rookery of wading birds including roseate spoonbills have been observed nesting on a spoil island north of the canal and west of Merritt Island. Common species of mammals, amphibians, and reptiles known to occur in east-central Florida may be found at the disposal sites as well.

3.7 AIR QUALITY

According to the Florida Department of Environmental Protection, Florida is one of only three states east of the Mississippi River to meet all national air quality standards.

3.8 CULTURAL RESOURCES

The project consists of maintenance dredging of an existing channel with the use of existing and previously used dredge disposal areas. Prior consultation (DHR Project file numbers 920797 and 954470) has determined that because of the location and nature of the project that there is little to no potential for historic properties to be present or to be affected.

3.9 RECREATION RESOURCES

Recreational boat traffic regularly transits the Canaveral Lock in order to access the Banana River, Port Canaveral or the Atlantic Ocean. In addition to boating, other locally available recreational activities include fishing, beach and park sports, as well as various cruise packages.

3.10 AESTHETIC RESOURCES

The project area consists of a commercial port bordered by various types of development. Nevertheless, the Banana River and Atlantic coastline in the vicinity of the project are considered to be picturesque waterways.

3.11 NOISE

Background noise from Port Canaveral, the adjacent military base, and nearby roadways appears to be minimal.

3.12 SOCIO-ECONOMIC

Employment and services generated by Port Canaveral provides a significant economic impact on the local economy of Brevard County. This impact also can be felt throughout central Florida and statewide (Canaveral Port Authority 2008).

In Brevard County, Port Canaveral Generates:

- 22,000+ Jobs
- More Than $902 Million in Wages
- More Than $1.3 Billion in Value Added Impact
- More Than $43 Million in Local Taxes
- More Than $87 Million in State Taxes

In Central Florida, Port Canaveral Generates:

- 35,000+ Jobs
- More Than $1.4 Billion in Wages
- More Than $2.2 Billion in Value Added Impact
- More Than $80 Million in Region Taxes
- More Than $163 Million in State Taxes

Statewide, Port Canaveral Generates:

- 36,000+ Jobs
- More Than $1.6 Billion in Wages
- More Than $2.5 Billion in Value Added Impact
- More Than $274 Million in State Taxes

Above data based on report provided by Braun and Tramell Economists and is for FY 2006.

3.13 NAVIGATION

In 2006, commercial vessels in and out of Canaveral Harbor made a total of 1,213 inbound and 1,219 outbound trips. These vessels transported 4,072,000 short tons of freight that included petroleum products, chemicals, crude materials, manufactured goods, food and farm products, and manufactured equipment (Waterborne Commerce of the United States 2006). Port Canaveral is also used by commercial cruise lines including Carnival, Disney, and Royal Caribbean International.

4 ENVIRONMENTAL EFFECTS

This section is the scientific and analytic basis for the comparisons of the alternatives. See table 1 in section 2.0 Alternatives, for summary of impacts. The following includes anticipated changes to the existing environment including direct, indirect, and cumulative effects.

4.1 THREATENED AND ENDANGERED SPECIES

4.1.1 NO-ACTION ALTERNATIVE

There would be no effect on threatened and endangered species if the proposed maintenance dredging was not performed.

4.1.2 DREDGING ALTERNATIVE

In accordance with Section 7 of the Endangered Species Act, coordination with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) will be performed. The Corps has determined that the proposed dredge work with placement of the material into the nearshore area or the ODMDS may affect, but is not likely to adversely affect sea turtles, manatees, northern right whale, or the smalltooth sawfish. This determination was based on the implementation of species specific protective measures and the type of dredging equipment typically used at Canaveral Harbor.

4.1.2.1 Sea Turtles

Since a clamshell dredge, or more unlikely a cutter suction pipeline dredge, would be used for this project, adverse impacts or "takings" of sea turtles within the proposed work area would not be anticipated. These types of dredges do not pose a risk to sea turtles like hopper dredges do. Pursuant to the Regional Biological Opinion issued by the NMFS, the use of a hopper dredge at Canaveral Harbor for routine maintenance work is prohibited. Also, as stated earlier, dredged material from Canaveral Harbor would not be placed on the beach. In order to further minimize potential adverse impacts to sea turtles, the following measures would be implemented:

- The contractor would instruct all personnel associated with construction activities about the potential presence of sea turtles in the area and the need to avoid collisions with them.

- Project lighting would comply with lighting requirements set by the USFWS.

- All personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing sea turtles, which are protected under the Endangered Species Act.

4.1.2.2 West Indian Manatee

Standard protective measures would be taken during dredging activities to ensure the safety of manatees. To make the contractor and his personnel aware of the potential presence of this species in the project area, their endangered status, and the need for precautionary measures, the contract specifications would include the following standard manatee protection clauses:

- The contractor would instruct all personnel associated with construction activities about the potential presence of manatees in the area and the need to avoid collisions with them.

- If siltation barriers are used, they shall be made of material in which manatees cannot become entangled, are properly secured, and are regularly monitored to avoid manatee entrapment. Barriers must not block manatee entry to or exit from essential habitat.

- If a manatee were sighted within 100 yards of the project area, all appropriate precautions would be implemented by the contractor to ensure protection of the manatee. These precautions would include the operation of all moving equipment no closer than 50 feet of a manatee. If a manatee were closer than 50 feet to moving equipment or the project area, the equipment would be shut down and all construction activities would cease to ensure protection of the manatee. Construction activities would not resume until the manatee has departed the project area.

- All vessels associated with the project would operate at 'no wake' speeds at all times while in shallow waters or channels where the draft of the boat provides less than three feet clearance from the bottom. Boats used to transport personnel would be shallow draft vessels, preferably of the light-displacement category, where navigational safety permits. Vessels transporting personnel between the landing and any workboat would follow routes of deep water to the greatest possible extent. Shore crews would use upland road access if available.

- Mooring bumpers would be placed on all large vessels wherever and whenever there is a potential for manatees to be crushed between two moored vessels. The bumpers would provide a minimum stand-off distance of four feet.

- During clamshell dredging operations, a dedicated observer will monitor for the presence of manatees. If manatees are present, the observer shall document all activities with the use of a video camera with the capabilities of video taping at night. The video tape shall have date/time signature and record all manatee movements in the construction area and note any reactions to turbidity, sound, and light.

- All personnel would be advised that there are civil and criminal penalties for harming, harassing, or killing manatees, which are protected under the Endangered Species Act and the Marine Mammal Protection Act.

4.1.2.3 Northern Right Whale

During the period December through March, barges or dredges moving through the designated critical habitat of the right whale shall take the following precautions:

- During evening hours or when there is limited visibility due to fog or sea states greater than Beaufort 3, the tug/barge or dredge operator shall slow down to 5 knots or less when traversing between areas if whales have been spotted within 15 nautical miles (nm) of the vessel's path within the previous 24 hours.

- During the period 1 December through 30 March, daily aerial surveys within 15 nautical miles (nm) of the dredging and disposal sites will be conducted by others to monitor for the presence of the right whale. Right whale sightings will be immediately communicated by marine radio to the dredging Contractor's dredge. In addition, the tug/barge or dredge operator shall maintain a 500-yard buffer between the vessel and any whale.

4.1.2.4 Smalltooth Sawfish

Due to the nature of the dredging equipment and the rarity of this species, the project is expected to have minimal impact on this species.

4.1.3 MATERIAL PLACEMENT OPTIONS

As with the proposed dredging, the Corps shall also coordinate with the USFWS on material placement options within upland sites. The Corps has determined that the placement of dredged material into the Canaveral Barge or West Disposal Sites may affect, but is not likely to adversely affect the eastern indigo snake or the Florida scrub jay. This determination was based on the implementation of protective measures for these species.

4.1.3.1 Eastern Indigo Snake

An indigo snake protection/education plan would be developed and would contain the following information:

- A qualified observer shall be present on site to watch for indigo snakes during all construction and clearing phases of the project.

- Description of the indigo snake, its habits, and protection under federal Law.

- Instructions not to injure, harm, harass or kill this species.

- Directions to notify the qualified observer(s) if an indigo snake is sighted.

- Directions to cease construction activity, notify the qualified observer, and allow the indigo snake sufficient time to move away from the site on its own before resuming construction (only a qualified individual, who has been either authorized by a Section 10(a)(1)(A) permit issued by the FWS, or designated as an agent of the state of Florida

by the FF&WCC for such activities, is permitted to come in contact with an indigo snake).

• Telephone numbers of pertinent agencies to be contacted if a dead indigo snake is encountered.

• Instructions that, if necessary, indigo snakes shall be held in captivity only long enough to transport them to a release site; at no time shall two snakes be kept in the same container during transportation.

4.1.3.2 Florida scrub jay

Surveys would be performed to determine the status of the Florida scrub jay on the Canaveral Barge Canal Disposal Site prior to construction. In the unlikely event that jays are found to be nesting on the property, then the Corps would avoid using the site during the nesting season. It is more likely that use of the site by jays is limited to foraging, as it has been in the past. In this case, disturbance of vegetation within the buffer zone would be avoided. Additional coordination with the USFWS would be performed if jays are present.

4.1.3.3 Gopher Tortoise

The state of Florida has recently classified the gopher tortoise as “Threatened”, and the federal government (at the time of this writing) is evaluating whether to take similar action. Therefore, until the federal government also lists the tortoise as “Threatened”, the Corps is not required to make a determination on how the proposed work may affect this species. It is, however, the intention of the Corps to survey both the Canaveral Barge Canal and West Disposal Sites prior to construction and, if necessary, relocate tortoises to an appropriate location in compliance with state protocols.

4.2 WATER QUALITY

4.2.1 NO-ACTION ALTERNATIVE

There would be no change in water quality if the proposed maintenance dredging was not performed.

4.2.2 DREDGING ALTERNATIVE

The primary anticipated change in water quality at the dredge site would be a temporary increase in turbidity. According to the state of Florida’s water quality standards, turbidity levels during dredging or placement of dredged material are not to exceed 29 nephelometric turbidity units (NTUs) above background levels at the edge of normally a 150-meter mixing zone. In order to comply with this standard, turbidity will be monitored according to state protocols during the proposed dredge work. If at any time the turbidity standard were exceeded, those activities causing the violation would cease. The Canaveral Barge Canal lies adjacent to the Banana River Aquatic Preserve. Coordination shall be conducted with the Florida Department of Environmental

Protection in order to determine acceptable turbidity increases within the preserve should the canal be dredged.

4.2.3 MATERIAL PLACEMENT OPTIONS

As with the dredging activity, the primary change in water quality during placement of dredged material within the nearshore or ODMDS would be a temporary increase in turbidity. This activity as well as any discharge from the weirs at the Canaveral Barge Canal and West Disposal Sites would be monitored similar to the dredging activity. Dredged material from the vicinity of the Trident dock would be placed within the West Disposal Site.

4.3 ESSENTIAL FISH HABITAT

4.3.1 NO-ACTION ALTERNATIVE

There would be no impact to Essential Fish Habitat (EFH) if the proposed maintenance dredging was not performed.

4.3.2 DREDGING ALTERNATIVE

The proposed maintenance dredging of the project channel and turning basins would impact approximately 535 acres of previously dredged estuarine/inshore water column and unconsolidated substrate. Dredging of the western portion of the Canaveral Barge Canal may also impact adjacent seagrass beds. In order to identify and avoid seagrass, the Corps shall survey the area immediately adjacent to the canal on the western side of the Banana River prior to construction. This same area would be surveyed after construction to determine if any adverse impact had occurred. The surveys would be conducted during the seagrass growing season, or summer months. If impacts occur as a result of the dredging, then the Corps would propose appropriate mitigation. However, as previously stated, it is the Corps' intention to avoid impacts to this resource. Species managed by the National Marine Fisheries Service that may occur within the project area can be found in Table 4, and prey species in Table 5. The Corps has determined that the proposed action would not have a substantial adverse impact on EFH or federally managed fisheries along the eastern coast of Florida. This determination was based on the fact that the substrate of the project area is comprised of a naturally dynamic unconsolidated substrate, and measures shall be taken to protect seagrass habitat. Turbidity would affect vision of marine life within the sediment plume as well as those marine organisms with gills, but these effects would be temporary as they would be limited to the actual dredging and placement operations. Annual maintenance dredging may suppress re-colonization of certain benthic organisms and therefore could impact other trophic levels within the food chain. However, it is important to note that the harbor is a man made facility, the actual channel width does not encompass the entire harbor, and similar habitat occurs immediately adjacent to the channel. This action shall be fully coordinated with the National Marine Fisheries Service.

4.3.3 MATERIAL PLACEMENT OPTIONS

Placement of dredged material into the Nearshore Placement Area would impact approximately 305 acres of marine/offshore water column and unconsolidated substrate. Placement at this site, as well as at the U.S. Environmental Protection Agency designated ODMDS, has occurred on multiple occasions in the past. The nearshore is not used every year and, therefore, the possibility of longer term adverse impacts, i.e. suppression of re-colonization of the area by indigenous species, would not be as great as the dredging area. Information on the marine resources of the ODMDS can be found in the Environmental Impact Statement prepared by the U.S. Environmental Protection Agency.

4.4 FISH AND WILDLIFE RESOURCES

4.4.1 NO-ACTION ALTERNATIVE

There would be no impact to fish and wildlife resources if the proposed maintenance dredging was not performed.

4.4.2 DREDGING ALTERNATIVE

As previously stated, dredging the project channel would result in impacts to benthos. The bottom of the channel would normally be re-colonized with organisms such as annelids and arthropods from adjacent similar habitats. However, since the channel is annually dredged benthic organisms may not fully recover. Sub-tidal oyster beds do not occur within the project footprint.

4.4.3 MATERIAL PLACEMENT OPTIONS

Dredged material would not be placed within the nearshore every year so re-colonization of the area by benthic organisms should occur. Placement of material within the ODMDS is performed on an annual basis, but actual placement locations within the site may vary from year to year and therefore, should improve benthic re-colonization (additional information on the ODMDS can be found within Environmental Impact Statement prepared by the U.S. Environmental Protection Agency).

The Corps would implement its migratory bird protection plan if work is performed at the upland disposal sites during the nesting season, April 1 through August 31. The plan would include monitoring the site during the nesting season. If nests were found, than a buffer zone of at least 200 feet would be placed around each nest. Clearing of vegetation from within the basin or the dikes would be performed outside the nesting season. The rookery on the spoil island west of Merritt Island is approximately 500 feet north of the channel. While it is unlikely that the rookery would be disturbed by dredging activity, the Corps shall coordinate this action with the appropriate resource agencies. No adverse impacts to migratory birds are anticipated with this plan in effect. Other types of wildlife that utilize the sites would be temporarily displaced during construction. However, these sites are infrequently used and therefore should be re-colonized by wildlife.

4.5 AIR QUALITY

4.5.1 NO-ACTION ALTERNATIVE

There would be no impact to air quality if the proposed maintenance dredging was not performed.

4.5.2 DREDGING ALTERNATIVE

Dredging equipment would emit exhaust fumes, but this would be a very temporary and minor degradation of local air quality.

4.5.3 MATERIAL PLACEMENT OPTIONS

Construction equipment at the upland disposal sites would emit exhaust fumes and create dust clouds. Cleared vegetation may be burned on site. The contract specifications would require the contractor to minimize pollution of air resources such as controlling particulates, i.e. dust, or excess machinery emissions. Appropriate permits would be obtained for open burning.

4.6 CULTURAL RESOURCES

No historic properties will be affected by any of the project alternatives

4.7 RECREATION RESOURCES

4.7.1 NO-ACTION ALTERNATIVE

There would be a minor adverse impact to recreational boating if the proposed maintenance dredging was not performed.

4.7.2 DREDGING ALTERNATIVE

Maintenance dredging of the project channel would provide a minor long-term benefit to recreational boating. Recreational traffic within Canaveral Harbor would be temporarily disrupted due to construction activities.

4.7.3 MATERIAL PLACEMENT OPTIONS

The upland disposal sites are not open to the public, and therefore the use of these sites would not impact recreational resources. Recreational use of the nearshore area or ODMDS would be temporarily disrupted if dredged material was placed at this location.

4.8 AESTHETIC RESOURCES

4.8.1 NO-ACTION ALTERNATIVE

There would be no impact to aesthetic resources if the proposed maintenance dredging was not performed.

4.8.2 DREDGING ALTERNATIVE

Construction activities within the project channel would temporarily impact the aesthetics of the area.

4.8.3 MATERIAL PLACEMENT OPTIONS

The upland disposal sites are not open to the public nor are they located in an area where construction activity would adversely impact aesthetic resources of adjacent areas. Aesthetic resources, or visual appeal, of the nearshore area and ODMDS would be temporarily adversely impacted if dredged material was placed at this location.

4.9 NOISE

4.9.1 NO-ACTION ALTERNATIVE

There would be no increased levels of noise if the proposed maintenance dredging was not performed.

4.9.2 DREDGING ALTERNATIVE

Construction activity would result in a minor short term increase over the existing background level.

4.9.3 MATERIAL PLACEMENT OPTIONS

The upland disposal sites as well as the nearshore area and ODMDS are not adjacent to residential neighborhoods or commercial enterprises, and therefore the minimal noise created by construction equipment would have no effect on the local community.

4.10 SOCIO-ECONOMIC

4.10.1 NO-ACTION ALTERNATIVE

There would be a major long-term adverse impact to Port Canaveral, commercial shipping, and naval interests, as well as the local, regional and statewide economies, if the authorized depth of the project channel was not maintained.

4.10.2 DREDGING ALTERNATIVE

Port Canaveral, commercial shipping, and naval interests would benefit if the proposed work was performed. It is important to note that this project would also benefit many businesses, both locally and around the state, that depend on the harbor for the transport of commodities.

4.10.3 MATERIAL PLACEMENT OPTIONS

There would be no impact to the local, regional and statewide economies with the use of the proposed dredged material placement areas.

4.11 NAVIGATION

4.11.1 NO-ACTION ALTERNATIVE

If the authorized depth of the project channel was not maintained, then shoaling would eventually make the harbor unsafe for deep draft vessels including commercial and navy ships.

4.11.2 DREDGING ALTERNATIVE

Performing the proposed work would result in safer navigation conditions for deep draft vessels.

4.11.3 MATERIAL PLACEMENT OPTIONS

The use of the nearshore area or ODMDS would have minimal impact on navigation.

4.12 CUMULATIVE IMPACTS

Cumulative impact is the "impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Table 5 summarizes the impact of such cumulative actions by identifying the past, present, and reasonably foreseeable future condition of the various resources which are directly or indirectly impacted by the proposed action and its alternatives. The table also illustrates the with-project and without-project condition (the difference being the incremental impact of the project). Also illustrated is the future condition with any reasonable alternatives (or range of alternatives).

TABLE 6: SUMMARY OF CUMULATIVE IMPACTS (NOTE: Canaveral Harbor was completely man made. The initial cut through the pre-existing barrier beach to create the Entrance Channel was made in 1951. Therefore, the timeline for this cumulative impacts analysis is from 1951 to the present, and is limited in space to the project area.)

	Past (historical project impacts)	Present (current project impacts)	Future without project	Future with Proposed Dredging and ocean disposal	Future with Proposed Dredging and nearshore disposal	Future with Proposed Dredging and upland disposal
Sea turtles	Use of hopper dredge resulted in mortalities. Jetties disrupted sand transfer affecting nesting areas. Harbor created habitat.	Use of clamshell results in no mortalities. Sand bypass compensates for sand disruption.	No effect, however, Port Canaveral may continue dredging without federal participation. Bypass would continue.	Minimal effect with use of clamshell or cutterhead dredge.	Minimal effect with use of clamshell or cutterhead dredge.	Minimal effect with use of clamshell or cutterhead dredge.
Manatees	Effect of dredging prior to protection measures unknown.	Manatee use of Canaveral Lock highest for any lock in Florida. Minimal effect with use of standard protection measures.	No effect, however, Port Canaveral may continue dredging without federal participation.	Minimal effect with use of standard protection measures.	Minimal effect with use of standard protection measures.	Minimal effect with use of standard protection measures.
Atlantic right whale	Effect of dredging prior to protection measures unknown.	Occasional sightings occur off Cape. Minimal effect with use of protective measures.	No effect, however, Port Canaveral may continue dredging without federal participation.	Minimal effect with use of protective measures.	Minimal effect with use of protective measures.	Minimal effect with use of protective measures.
Smalltooth sawfish	Historical impacts unknown.	Minimal effect.	Minimal effect.	Minimal effect.	Minimal effect.	Minimal effect.
Eastern indigo snake	Loss of habitat with construction of harbor and upland disposal sites.	Portions of upland disposal sites may support this species. Minimal effect occurring with draft protection measures.	No effect, however, Port Canaveral may continue dredging without federal participation and use upland sites.	No effect.	No effect.	Minimal effect with draft protective measures.

	Past (historical project impacts)	Present (current project impacts)	Future without project	Future with Proposed Dredging and ocean disposal	Future with Proposed Dredging and nearshore disposal	Future with Proposed Dredging and upland disposal
Florida scrub-jay	Loss of habitat with construction of harbor and upland disposal sites.	Portions of upland disposal sites may support this species. Minimal effect occurring with avoidance of work during nesting and protection of buffer zone.	No effect, however, Port Canaveral may continue dredging without federal participation and use upland sites.	No effect.	No effect.	Minimal effect occurring with avoidance of work during nesting season and protection of buffer zone.
Gopher tortoise	Loss of habitat with construction of harbor and upland disposal sites.	Upland disposal sites do support this species. Tortoise burrows are avoided or animals relocated.	No effect, however, Port Canaveral may continue dredging without federal participation and use upland sites.	No effect.	No effect.	Tortoise burrows would be avoided or animals relocated.
Water quality	Harbor created a source of pollution (i.e. runoff, spills). Temporary increase in turbidity with past dredging events.	Pollution prevention measures has resulted in Class III designation for harbor. Temporary increase in turbidity with dredging. Material that does not pass bio-assay tests is placed in upland site.	Pollution prevention measures should continue. No effect, however, Port Canaveral may continue dredging without federal participation.	Pollution prevention measures should continue. Temporary increase in turbidity with dredging.	Pollution prevention measures should continue. Temporary increase in turbidity with dredging.	Pollution prevention measures should continue. Temporary increase in turbidity with dredging. Material that does not pass bio-assay tests would be placed in upland site.
Essential Fish Habitat	Harbor created aquatic habitat. No substantial effect on Federally managed fish species	No substantial effect on Federally managed fish species with avoidance of seagrass.	No effect, however, Port Canaveral may continue dredging without federal participation.	No substantial effect on Federally managed fish species.	No substantial effect on Federally managed fish species.	No substantial effect on Federally managed fish species with avoidance of seagrass.

	Past (historical project impacts)	Present (current project impacts)	Future without project	Future with Proposed Dredging and ocean disposal	Future with Proposed Dredging and nearshore disposal	Future with Proposed Dredging and upland disposal
Fish and Wildlife Resources	Loss of terrestrial habitat with construction of harbor and upland disposal sites. Harbor created aquatic habitat. Annual maintenance dredging suppressed benthic organisms.	Annual maintenance dredging suppresses benthic organisms. Minimal impact on migratory birds with protective measures. Other wildlife temporarily displaced when upland sites are used.	No effect, however, Port Canaveral may continue dredging without federal participation.	Annual maintenance dredging would suppress benthic organisms.	Annual maintenance dredging would suppress benthic organisms.	Annual maintenance dredging would suppress benthic organisms. Minimal impact on migratory birds with protective measures. Other wildlife temporarily displaced when upland sites are used.
Air Quality	Local emissions increased with creation of harbor. Minor emissions from dredging equipment.	Minor emissions from dredging equipment. In attainment with air quality standards.	No effect, however, Port Canaveral may continue dredging without federal participation.	Minor emissions from dredging equipment. Expected to be in attainment.	Minor emissions from dredging equipment. Expected to be in attainment.	Minor emissions from dredging equipment. Expected to be in attainment. Permits would be obtained for open burning of cleared vegetation.
Cultural Resources	No Historic Properties affected.	No Historic Properties affected.	No Historic Properties affected.	No Historic Properties affected.	No Historic Properties affected.	No Historic Properties affected.
Recreation Resources	Construction of harbor created recreational opportunities (boating).	Dredging beneficial to recreational boating. Equipment disrupts boat traffic.	No effect, however, Port Canaveral may continue dredging without federal participation.	Dredging beneficial to recreational boating. Equipment would disrupt boat traffic.	Dredging beneficial to recreational boating. Equipment would disrupt boat traffic.	Dredging beneficial to recreational boating. Equipment would disrupt boat traffic.

	Past (historical project impacts)	Present (current project impacts)	Future without project	Future with Proposed Dredging and ocean disposal	Future with Proposed Dredging and nearshore disposal	Future with Proposed Dredging and upland disposal
Aesthetic Resources	Construction of harbor affected local aesthetic resources.	Equipment temporarily affects aesthetic resources.	No effect, however, Port Canaveral may continue dredging without federal participation.	Equipment would temporarily affect aesthetic resources.	Equipment would temporarily affect aesthetic resources.	Equipment would temporarily affect aesthetic resources.
Noise	Construction of harbor minimally increased local noise levels.	Equipment noise is minimal.	No effect, however, Port Canaveral may continue dredging without federal participation.	Equipment noise would be minimal.	Equipment noise would be minimal.	Equipment noise would be minimal.
Socio-Economics	Construction of harbor created a significant positive economic stimulus.	Harbor continues to provide an economic stimulus.	There would be a significant adverse economic impact if the proposed work was not performed. However, Port Canaveral may continue dredging without federal participation.	There would be a significant positive economic impact if the proposed work was performed.	There would be a significant positive economic impact if the proposed work was performed.	There would be a significant positive economic impact if the proposed work was performed.
Navigation	Construction of harbor created a major port for deep draft vessels along the east-central coast of Florida.	Continued maintenance dredging of the harbor provides safe navigation for deep draft vessels.	There would be a significant adverse impact to navigation if the proposed work was not performed. However, Port Canaveral may continue dredging without federal participation.	There would be a significant beneficial impact to navigation if the proposed work was performed.	There would be a significant beneficial impact to navigation if the proposed work was performed.	There would be a significant beneficial impact to navigation if the proposed work was performed.

4.13 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

4.13.1 IRREVERSIBLE

An irreversible commitment of resources is one in which the ability to use and/or enjoy the resource is lost forever. Other then the use of fuel, equipment and supplies, there would be no irreversible commitment of resources.

4.13.2 IRRETRIEVABLE

An irretrievable commitment of resources is one in which, due to decisions to manage the resource for another purpose, opportunities to use or enjoy the resource as they presently exist are lost for a period of time. Dredging would temporarily disrupt navigation and recreational activities.

4.14 UNAVOIDABLE ADVERSE ENVIRONMENTAL EFFECTS

The dredging of the project channel and placement of dredged material into the nearshore and ODMDS would adversely impact benthic organisms and some fish species. Use of the upland disposal sites would result in the removal of vegetation within the interior of these sites and would adversely impact wildlife.

4.15 LOCAL SHORT-TERM USES AND MAINTENANCE/ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The proposed annual maintenance work is typically of short duration. Adversely affected benthos would be expected to recover in less than a year, possibly longer. However, some benthic species may not achieve full recovery since maintenance dredging would occur on an annual basis. Most fish species and other motile organisms like crabs should be able to avoid the dredging equipment. Since the project area is limited in size, the long-term productivity of fish and other motile species should not be significantly affected. Placement of dredged material within the upland disposal sites is also typically of short duration, but does result in the removal of vegetation within the interior of these sites and would adversely impact wildlife. As these sites are only periodically used, the vegetation would be expected to grow back and the wildlife should eventually re-colonize the interior of the properties.

4.16 INDIRECT EFFECTS

Maintaining the authorized depth of the project channel would benefit Port Canaveral, the shipping industry, local and statewide economies. This may eventually lead to

expansion of the port, deepening the project channel, and contribute to increased development in adjacent areas.

4.17 COMPATIBILITY WITH FEDERAL, STATE, AND LOCAL OBJECTIVES

This project has wide support and is compatible with federal, state, and local objectives.

4.18 CONFLICTS AND CONTROVERSY

In the past, a large percentage of the dredged material from the project channel has had significant percentages of silt. Therefore, in compliance with the Florida Sand Rule, the Corps proposes that the material not be placed on the beach. Dredging of the Canaveral Barge Canal would be done in a manner that would avoid, or minimize impacts, to seagrass. Surveys would be performed before dredging the canal and after the work has been completed in order to determine if any impact had occurred. Appropriate mitigation would be performed if seagrass were impacted. Dredging in the vicinity of the Banana River Aquatic Preserve would be performed in compliance with the Water Quality Certification issued by the state.

4.19 UNCERTAIN, UNIQUE, OR UNKNOWN RISKS

There are no uncertain, unique or unknown risks associated with the proposed work.

4.20 PRECEDENT AND PRINCIPLE FOR FUTURE ACTIONS

As this project involves annual maintenance dredging which has been performed for a number of years, there would be no precedent and or principle for future actions established.

4.21 ENVIRONMENTAL COMMITMENTS

The U.S. Army Corps of Engineers and contractors commit to avoiding, minimizing or mitigating for adverse effects during construction activities by including the following commitments in the contract specifications:

1. A clamshell or cutterhead dredge would be used to perform the proposed work; therefore, adverse impacts to sea turtles would not be anticipated. Dredged material would not be placed on the beach; therefore, adverse impacts to nesting sea turtles would not occur. Other sea turtle protective measures, such as informing contract personnel of the presence of sea turtles in the area and the need to avoid collisions with them as well as equipment lighting requirements shall also be implemented.

2. Standard protective measures for manatees shall be required.

3. Protective measures for the Atlantic right whale shall be required.

4. The draft indigo snake protection measures shall be implemented in the event that the upland disposal sites are used.

5. If the Canaveral Barge Canal disposal site is used, then the property shall be surveyed for Florida scrub-jays and protective measures such as avoiding nests shall be implemented and minimizing disturbance of the buffer zone shall be considered.

6. If either upland disposal site is used, then the site(s) shall be surveyed for gopher tortoises and if burrows cannot be avoided, then tortoises shall be relocated in compliance with state protocols.

7. The District's migratory bird protection policy shall be implemented.

8. The work shall be performed in compliance with state water quality statutes.

9. If the Canaveral Barge Canal is dredged, then a pre- and post-construction seagrass survey shall be performed adjacent to the canal on the western side of the Banana River. If the surveys show that the dredging has impacted seagrass, then appropriate mitigation shall be proposed.

10. Air emissions such as vehicular exhaust and dust shall be controlled. If required, a burn permit shall be acquired in the event that vegetation is burned at the upland disposal sites.

11. The contracting officer would notify the contractor in writing of any observed noncompliance with federal, state, or local laws or regulations, permits and other elements of the contractor's Environmental Protection Plan. The contractor would, after receipt of such notice, inform the contracting officer of proposed corrective action and take such action as may be approved. If the contractor fails to comply promptly, the contracting officer would issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions would be granted or costs or damages allowed to the contractor for any such suspension.

12. The contractor would train his personnel in all phases of environmental protection. The training would include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities to insure adequate and continuous environmental pollution control. Quality control and supervisory personnel would be thoroughly trained in the proper use of monitoring devices and abatement equipment, and would be thoroughly knowledgeable of federal, state, and local laws, regulations, and permits as listed in the Environmental Protection Plan submitted by the contractor.

13. The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract would be protected during the entire period of this contract. The contractor would confine his activities to areas defined by the drawings and specifications.

14. As stated in the standard contract specifications, the disposal of hazardous or solid wastes would be in compliance with federal, state, and local laws. A spill prevention plan would also be required.

4.22 COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

4.22.1 NATIONAL ENVIRONMENTAL POLICY ACT OF 1969

Environmental information on the project is being compiled and a draft Environmental Assessment has been prepared. The project shall be in compliance with the National Environmental Policy Act.

4.22.2 ENDANGERED SPECIES ACT OF 1973

Consultation shall be initiated with NMFS and the USFWS. This project shall be fully coordinated under the Endangered Species Act and therefore, shall be in full compliance with the act.

4.22.3 FISH AND WILDLIFE COORDINATION ACT OF 1958

This project shall be coordinated with the U.S. Fish and Wildlife Service (USFWS). A Coordination Act Report (CAR) is not required for the proposed work. This project shall be in full compliance with the act.

4.22.4 NATIONAL HISTORIC PRESERVATION ACT OF 1966 (INTER ALIA)

(PL 89-665, the Archeology and Historic Preservation Act (PL 93-291), and executive order 11593)
Archival research, and consultation with the Florida State Historic Preservation Officer (SHPO), have been conducted in accordance with the National Historic Preservation Act, as amended; the Archeological and Historic Preservation Act, as amended and Executive Order 11593. This project shall be coordinated with the SHIPO. The project would not affect historic properties included in or eligible for inclusion in the National Register of Historic places. The project shall be in compliance with each of these federal laws.

4.22.5 CLEAN WATER ACT OF 1972

The project shall be in compliance with this act. A Section 401 water quality certification shall be obtained from the Florida Department of Environmental Protection. All state water quality standards would be met. A Section 404(b) evaluation is included in this report as Appendix A. A public notice shall be issued in a manner which satisfies the requirements of Section 404 of the Clean Water Act.

4.22.6 CLEAN AIR ACT OF 1972

Vehicular emission and airborne dust particulates resulting from construction activities shall be controlled. If necessary, a burn permit shall be acquired for the burning of vegetation at the upland disposal sites.

This project shall be coordinated with U.S. Environmental Protection Agency (EPA) and shall be in compliance with Section 309 of the act. Correspondence from EPA shall be placed in Appendix C and discussion of any issues therein can be found in the Public and Agency Involvement section of this statement.

4.22.7 COASTAL ZONE MANAGEMENT ACT OF 1972

A federal consistency determination in accordance with 15 CFR 930 Subpart C is included in this report as Appendix B. State consistency review shall be performed during the coordination of the draft EA to ensure that the project is consistent with the Florida Coastal Zone Management Program.

4.22.8 FARMLAND PROTECTION POLICY ACT OF 1981

No prime or unique farmland would be impacted by implementation of this project. This act is not applicable.

4.22.9 WILD AND SCENIC RIVER ACT OF 1968

No designated Wild and Scenic river reaches would be affected by project related activities. This act is not applicable.

4.22.10 MARINE MAMMAL PROTECTION ACT OF 1972

Protective measures for marine mammals such as manatees and right whales shall be implemented. This project shall be coordinated with the US Fish and Wildlife Service and National Marine Fisheries Service. The work shall be in full compliance with the act.

4.22.11 ESTUARY PROTECTION ACT OF 1968

No designated estuary would be affected by project activities. This act is not applicable.

4.22.12 FEDERAL WATER PROJECT RECREATION ACT

The principles of the Federal Water Project Recreation Act, (Public Law 89-72) as amended, have been fulfilled by complying with the recreation cost sharing criteria as outlined in Section 2 (a), paragraph (2).

4.22.13 FISHERY CONSERVATION AND MANAGEMENT ACT OF 1976

The project shall be coordinated with the National Marine Fisheries Service (NMFS) and shall be in compliance with the act.

4.22.14 SUBMERGED LANDS ACT OF 1953

The project would occur on submerged lands of the state of Florida. The project shall be coordinated with the state and shall be in compliance with the act.

4.22.15 COASTAL BARRIER RESOURCES ACT AND COASTAL BARRIER IMPROVEMENT ACT OF 1990

There are no designated coastal barrier resources in the project area that would be affected by this project. These acts are not applicable.

4.22.16 RIVERS AND HARBORS ACT OF 1899

The proposed work would not obstruct navigable waters of the United States. The proposed action shall be subject to the public notice, possible public hearing, and other evaluations normally conducted for activities subject to the act. The project shall be in full compliance.

4.22.17 ANADROMOUS FISH CONSERVATION ACT

Anadromous fish species would not be affected. The project shall be coordinated with the National Marine Fisheries Service and shall be in compliance with the act.

4.22.18 MIGRATORY BIRD TREATY ACT AND MIGRATORY BIRD CONSERVATION ACT

Measures shall be taken to protect migratory birds, i.e. avoiding nesting sites. The project shall be in compliance with these acts.

4.22.19 MARINE PROTECTION, RESEARCH AND SANCTUARIES ACT

The term "dumping" as defined in the Act (3[33 U.S.C. 1402](f)) does not apply to the disposal of material for beach nourishment or to the placement of material for a purpose other than disposal (i.e. placement of rock material as an artificial reef or the construction of artificial reefs as mitigation). Therefore, the Marine Protection, Research and Sanctuaries Act does not apply to this project. The disposal activities addressed in this EA have been evaluated under Section 404 of the Clean Water Act.

4.22.20 MAGNUSON-STEVENS FISHERY CONSERVATION AND MANAGEMENT ACT

The Corps has determined that the project would not have a substantial adverse impact on Essential Fish Habitat or federally managed fish species occurring along the east-central coast of Florida. The proposed work shall be fully coordinated with the National Marine Fisheries Service. The project shall be in full compliance with the act.

4.22.21 E.O. 11990, PROTECTION OF WETLANDS

No wetlands would be affected by project activities. This project is in compliance with the goals of this Executive Order.

4.22.22 E.O. 11988, FLOOD PLAIN MANAGEMENT

This project would have no adverse impacts to flood plain management.

4.22.23 E.O. 12898, ENVIRONMENTAL JUSTICE

The proposed action would not result in adverse human health or substantial environmental effects. The work would not impact "subsistence consumption of fish and wildlife.

4.22.24 E.O. 13089, CORAL REEF PROTECTION

This project would not impact those species, habitats, and other natural resources associated with coral reefs.

4.22.25 E.O. 13112, INVASIVE SPECIES

This project would not introduce any invasive species. Exotic invasive species of plants such as Brazilian pepper are well established at the upland disposal sites.

5 LIST OF PREPARERS

5.1 PREPARERS

Preparer	Discipline	Role
Paul Stodola, U.S. Army Corps of Engineers	Biologist	Principal Author
Paul Lazar, U.S. Army Corps of Engineers	Engineer	Construction-Operations, Engineering
Grady Caulk, U.S. Army Corps of Engineers	Archaeologist	Cultural Resources

5.2 REVIEWERS

This draft Environmental Assessment shall be reviewed by the supervisory chain of the Environmental Branch and Planning Division, as well as the Construction-Operations Division, Project Management, and the Office of Counsel of the US Army Corps of Engineers, Jacksonville District.

6 PUBLIC INVOLVEMENT

6.1 SCOPING AND DRAFT EA

A Public Notice shall be issued for this action. The draft EA and Finding of No Significant Impact (FONSI) shall be made available to the public upon request (see copy of notice with draft FONSI in Appendix C).

6.2 AGENCY COORDINATION

Coordination shall be conducted with appropriate agencies and described in this report upon completion. Any agency coordination letters shall be placed in Appendix C.

6.3 LIST OF RECIPIENTS

Per the Public Notice, copies of the draft EA shall be made available to appropriate stakeholders upon request. A list of stakeholders receiving notification can be found within the Public Notice.

6.4 COMMENTS RECEIVED AND RESPONSE

Comments received and responses shall be placed in the EA.

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APPENDIX A - SECTION 404(B) EVALUATION

SECTION 404(b) EVALUATION

MAINTENANCE DREDGING
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA

I. Project Description

a. Location. The proposed work would be performed within the federal system of channels at Canaveral Harbor, Brevard County, Florida. Placement operations would occur at designated locations (please see Figure 1).

b. General Description. The work would involve annual maintenance dredging of up to 1,500,000 cubic yards of material from the project channels. Dredged material would be placed in the Ocean Dredged Material Disposal Site (ODMDS), nearshore, and upland disposal sites. Dredged material would not be placed on the beach (please see Section 1.1 for more information).

c. Authority and Purpose. Construction of the entrance channel, jetties, turning basin, and barge canal with a navigation lock were authorized on 2 March 1945 by House Document 367, 77th Congress, 1st Session. Maintenance of the improved channel and turning basin, enlargement of the barge canal and lock, dike relocation, construction of a channel and turning basin west of the existing turning basin were authorized on 23 October 1962 by Senate Document 140, 87th Congress, 2nd Session. The 1992 Water Resources Development Act authorized Canaveral Harbor's current project civil works depth and width. Maintenance dredging would maintain the authorized depths of the project channels.

d. General Description of Dredged or Fill Material.

(1) General Characteristics of Material. Dredged material from the project channel typically consists of shoal material containing silt, clay, sand and shell. Silt content generally exceeds 10% (please see Section 3.2 for more information).

(2) Quantity of Material. Up to 1,500,000 cubic yards would be annually removed.

(3) Source of Material. From the federal system of channels at Canaveral Harbor (please refer to Section 1.1 for more information)

e. Description of the Proposed Discharge Site(s).

(1) Location. The ODMDS, nearshore, and upland disposal sites (please see Figure 1. Project Map and Section 2 for more information).

(2) Size. ODMDS: 2 nmi by 2 nmi; Nearshore Area: 305 acres; West Disposal Site: 56 acres; Canaveral Barge Canal Disposal Site: 31 acres.

(3) Type of Site: ODMDS: open water (ocean); Nearshore Area: open water (ocean); West Disposal and Canaveral Barge Canal Disposal Sites: confined upland areas.

(4) Type(s) of Habitat. ODMDS and Nearshore Area are open water habitats with unconsolidated substrate; West Disposal and Canaveral Barge Canal Disposal Sites are confined, disturbed upland habitats (please see Section 3 for more information).

(5) Timing and Duration of Discharge. Timing is undetermined and duration is generally less than four months.

f. Description of Disposal Method. Dredging is typically performed by clamshell dredge, but the work can be done by cutterhead suction pipeline dredge. When done by clamshell, material is placed in a bottom dumping barge and transported to ODMDS or Nearshore Area for disposal. Material is typically piped into upland sites.

II. Factual Determinations

a. Physical Substrate Determinations.

(1) Substrate Elevation and Slope. The project channel has a sloped bottom with varying authorized depths (please see Section 1.1 for more information). Actual depths vary widely through the year due to shoaling.

(2) Sediment Type. Unconsolidated with sand, silt, clay and shell (please see Section 3.2 for more information).

(3) Dredged/Fill Material Movement. Material placed in the Nearshore Area becomes part of the littoral drift system. Material placed in the ODMDS initially remains within the site upon placement, but may be moved by currents over time (refer to ODMDS EIS prepared by US Environmental Protection Agency).

(4) Physical Effects on Benthos. Benthic organisms would be impacted by dredging activity and placement operations. Re-colonization should begin in less than one year. However, full recovery may not occur within the project channel since the proposed dredging would be performed on an annual basis.

(5) Actions to minimize impacts. Dredge location and placement operations would be monitored to ensure that construction activities are performed in authorized project areas only.

b. Water Circulation. Fluctuation and Salinity Determinations.

(1) Water Column Effects.

(a) Salinity: No significant effect.
(b) Water Chemistry: No significant effect.
(c) Clarity: Turbidity would temporarily decrease clarity.
(d) Color: Turbidity would temporarily change color.
(e) Odor: No significant effect.
(f) Taste: No significant effect.
(g) Dissolved Gas Levels: No significant effect.
(h) Nutrients: No significant effect.

(2) Current Patterns and Circulation.

(a) Current Patterns and Flow: Currents in the project area are primarily tidal. Dredging and placement operations would not affect current patterns or flow.
(b) Velocity: No significant effect.
(c) Stratification: No significant effect.
(d) Hydrologic Regime: No significant effect.

(3) Normal Water Level Fluctuations. Tides in the project area are semi diurnal with varying levels throughout the year. The project would not affect normal water level fluctuations.

(4) Salinity Gradients. The project would not affect salinity gradients.

(5) Actions to minimize impacts. The project would not affect water levels or flow patterns. Turbidity would be monitored per the requirements of the state permit. If at any time the turbidity standard were exceeded, those activities causing the violation would cease.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. There will be an increase in suspended particulates and turbidity levels in the vicinity of the disposal site.

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column.

(a) Light Penetration: Light penetration would decrease during dredging and placement operations in open water sites.

(b) Dissolved Oxygen: Dissolved oxygen levels would not be significantly altered by this project.
(c) Toxic Metals and Organics: Sediments in the vicinity of the Trident dock would be placed within the West Disposal Site.
(d) Pathogens: This project would not cause any release of pathogens.
(e) Aesthetics: Turbidity would temporarily impact aesthetic quality of the project channel and open water placement locations.

(3) Effects on Biota.

(a) Primary Production, Photosynthesis: The project would not have a significant impact on primary production or photosynthesis.
(b) Suspension/Filter Feeders: Turbidity would affect suspension/ filter feeders, but the effects would not be significant.
(c) Sight Feeders: Sight feeders would be affected by turbidity, but the effects would not be significant.

(4) Actions to minimize impacts. As stated earlier, turbidity would be monitored per the requirements of the state permit. If at any time the turbidity standard were exceeded, those activities causing the violation would cease.

d. Contaminant Determinations. Levels of contaminants are not expected to have a significant impact on plankton, benthos, nekton, or the aquatic food web. Dredged material from the vicinity of the Trident dock has failed to pass the bioassay test. However, re-suspension of this sediment within the Trident basin is expected to have minimal impact on these organisms. Sediments in the vicinity of the Trident dock shall continue to be monitored on a regular basis, and bioassay tests performed.

e. Aquatic Ecosystem and Organism Determinations. .

(1) Effects on Plankton: Significant effects on plankton are not anticipated.
(2) Effects on Benthos: Benthos would be impacted by the project, but benthic organisms would be expected to begin recovery within one year. However, full recovery may not occur since the proposed dredging would be performed on an annual basis.
(3) Effects on Nekton: Significant effects on nekton are not anticipated.
(4) Effects on Aquatic Food Web: As stated earlier, benthos would be impacted, but additional significant effects on the food web are not anticipated.
(5) Effects on Special Aquatic Sites.

(a) Sanctuaries and Refuges: Dredging of the Canaveral Barge Canal is not expected to have a significant impact on the adjacent

Banana River Aquatic Preserve. This work would be performed in compliance with the Water Quality Certification issued by the state of Florida.
(b) Wetlands: The proposed work would not affect wetlands.
(c) Mud Flats: The proposed work would not affect mud flats.
(d) Vegetated Shallows: Measures shall be implemented to avoid and minimize impacts to seagrass adjacent to the western portion of the Canaveral Barge Canal. If inadvertent impacts occur, then appropriate mitigation would be proposed.
(e) Coral Reefs: There are no coral reefs in the project area.
(f) Riffle and Pool Complexes: There are no riffle and pool complexes in the project area.

(3) Threatened and Endangered Species. The project would not have a significant impact on threatened and endangered species.

(4) Other Wildlife. Clearing of the upland disposal sites would adversely impact wildlife. Re-colonization of these sites should occur since they are not used on an annual basis.

(5) Actions to Minimize Impacts. Measures shall be taken to avoid or minimize impacts to threatened and endangered species as well as other wildlife (please refer to Section 4 and 4.21).

e. Proposed Disposal Site Determinations

(1) Mixing Zone Determination. This determination will be in accordance with the Water Quality Certification issued for this project.

(2) Determination of Compliance with Applicable Water Quality Standards. The work would be conducted in accordance with the Water Quality Certification issued for this project.

(3) Potential Effects on Human Use Characteristic.
(a) Municipal and Private Water Supply: No effects are anticipated.
(b) Recreational and Commercial Fisheries: Impacts to fisheries would not be significant (please see Sections 3.5 and 4.3).
(c) Water Related Recreation: Construction activities would temporarily disrupt water related recreation.
(d) Aesthetics: Construction would temporarily impact aesthetics.
(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves: The Canaveral Barge Canal lies adjacent to the Banana River Aquatic Preserve. Work in this area would be conducted in compliance with the Water Quality Certification issued by the state of Florida.

f. Determination of Cumulative Effects on the Aquatic Ecosystem. Annual dredging and placement operations would have impacts on the aquatic ecosystem. Most impacts should be relatively short-term; however, populations of benthic organisms within the channel footprint may never fully recover because the dredging is performed every year (please see Section 4.12 for more information).

h. Determination of Secondary Effects on the Aquatic Ecosystem. Maintaining the authorized depths of Canaveral Harbor may provide a stimulus for economic growth, which could encourage further deepening of the port. These actions could further impact the aquatic ecosystem.

III. Findings of Compliance or Non-Compliance With the Restrictions on Discharge 3/

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation: No significant adaptations of the guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem: No practical alternative exists which meets the project objectives that do not involve discharge of fill into waters of the United States.

c. Compliance with Applicable State Water Quality Standards: After consideration of material placement site dilution and dispersion, the discharge of fill materials would not cause or contribute to, violations of any applicable state water quality standards for Class III Waters. Dredging of the Canaveral Barge Canal which is adjacent to the Banana River Aquatic Preserve would also be performed in compliance with the Water Quality Certification issued by the state of Florida.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 Of the Clean Water Act: The discharge operation would not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

e. Compliance with Endangered Species Act of 1973: The proposed project would not jeopardize the continued existence of any species listed as threatened or endangered or result in the destruction or adverse modification of any critical habitat as specified by the Endangered Species Act of 1973.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection. Research, and Sanctuaries Act of 1972: This act does not apply to this project.

g. Evaluation of Extent of Degradation of the Waters of the United States

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies: No effect.

(b) Recreation and Commercial Fisheries: No substantial adverse impacts are anticipated.
(c) Plankton: No substantial adverse impacts are anticipated.
(d) Fish: No substantial adverse impacts are anticipated.
(e) Shellfish: No substantial adverse impacts are anticipated.
(f) Wildlife: Clearing of the upland disposal sites would adversely impact wildlife. Re-colonization of these sites should occur since they are not used on an annual basis.
(g) Special Aquatic Sites: No substantial adverse impacts are anticipated.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems: Most impacts should be relatively short-term; however, populations of benthic organisms within the channel footprint may never fully recover because the dredging is performed every year.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability: Certain benthos may not fully recover, so productivity and stability of these species may decline due to annual maintenance dredging.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values: Recreation and aesthetic values would be temporarily disrupted due to construction activity.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem: Measures shall be taken to minimize impacts (please see Section 4.21 for more information).

i. On the basis of the guidelines the proposed disposal site(s) for the discharge of dredged or fill material is specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem.

FINDING OF COMPLIANCE
FOR
MAINTENANCE DREDGING
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA

1. No significant adaptations of the guidelines were made relative to this evaluation.

2. Two alternative open water disposal sites are available for this project. Use of either of these sites (Figure 1) would not result in significant impacts to water level fluctuation, circulation or currents.

3. The planned disposal of dredged material at either open water site would not violate any applicable state water quality standards with the possible exception of turbidity. Therefore, turbidity standards would be monitored per the Water Quality Certification issued by the state of Florida. If a turbidity violation is noted, then those activities causing the violation shall be terminated. The disposal operation will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.

4. Use of the selected disposal sites will not harm any endangered species or their critical habitat or violate protective measures for the Banana River Aquatic Preserve.

5. The proposed disposal of dredged material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreation and commercial fishing, plankton, fish, shellfish, wildlife, and special aquatic sites. Significant adverse effects on life stages of aquatic life and other wildlife, aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values will not occur.

6. Appropriate steps shall be taken to minimize potential adverse impacts of the discharge on aquatic systems.

7. On the basis of the guidelines the proposed disposal sites for the discharge of dredged material is specified as complying with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem.

APPENDIX B - COASTAL ZONE MANAGEMENT CONSISTENCY

FLORIDA COASTAL ZONE MANAGEMENT PROGRAM
FEDERAL CONSISTENCY EVALUATION PROCEDURES

MAINTENANCE DREDGING
CANAVERAL HARBOR
BREVARD COUNTY, FLORIDA

1. Chapter 161, Beach and Shore Preservation. The intent of the coastal construction permit program established by this chapter is to regulate construction projects located seaward of the line of mean high water and which might have an effect on natural shoreline processes.

Response: The proposed plans and information will be voluntarily submitted to the state in compliance with this chapter.

2. Chapters 163(part II), 186, and 187, County, Municipal, State and Regional Planning. These chapters establish the Local Comprehensive Plans, the Strategic Regional Policy Plans, and the State Comprehensive Plan (SCP). The SCP sets goals that articulate a strategic vision of the state's future. It's purpose is to define in a broad sense, goals, and policies that provide decision-makers directions for the future and provide long-range guidance for an orderly social, economic and physical growth.

Response: The proposed project shall be coordinated with various federal, state and local agencies during the planning process. The project meets the primary goal of the State Comprehensive Plan through preservation and protection of the shorefront development and infrastructure.

3. Chapter 252, Disaster Preparation, Response and Mitigation. This chapter creates a state emergency management agency, with the authority to provide for the common defense; to protect the public peace, health and safety; and to preserve the lives and property of the people of Florida.

Response: The proposed project involves the maintenance dredging of Canaveral Harbor in order to maintain safe navigation conditions. Therefore, this project would be consistent with the efforts of Division of Emergency Management.

4. Chapter 253, State Lands. This chapter governs the management of submerged state lands and resources within state lands. This includes archeological and historical resources; water resources; fish and wildlife resources; beaches and dunes; submerged grass beds and other benthic communities; swamps, marshes and other wetlands; mineral resources; unique natural features; submerged lands; spoil islands; and artificial reefs.

Response: The proposed project would comply with state regulations pertaining to the above resources. The work would comply with the intent of this chapter.

5. Chapters 253, 259, 260, and 375, Land Acquisition. This chapter authorizes the state to acquire land to protect environmentally sensitive areas.

Response: Since the affected property already is in public ownership or is under an easement for public placement use, this chapter does not apply.

6. Chapter 258, State Parks and Aquatic Preserves. This chapter authorizes the state to manage state parks and preserves. Consistency with this statute would include consideration of projects that would directly or indirectly adversely impact park property, natural resources, park programs, management or operations.

Response: The proposed project shall be coordinated with the state of Florida regarding project activities adjacent to the Banana River Aquatic Preserve. The project shall be consistent with this chapter.

7. Chapter 267, Historic Preservation. This chapter establishes the procedures for implementing the Florida Historic Resources Act responsibilities.

Response: This project shall be coordinated with the State Historic Preservation Officer (SHPO). Because of the nature of the project there is little to no potential for presence of historic properties to be present, no surveys are anticipated. The project will be consistent with this chapter.

8. Chapter 288, Economic Development and Tourism. This chapter directs the state to provide guidance and promotion of beneficial development through encouraging economic diversification and promoting tourism.

Response: The proposed maintenance dredging encourages commercial and recreational use that in turn provides economic benefits to the area. This would be compatible with tourism for this area and therefore, is consistent with the goals of this chapter.

9. Chapters 334 and 339, Transportation. This chapter authorizes the planning and development of a safe balanced and efficient transportation system.

Response: No public transportation systems would be impacted by this project.

10. Chapter 370, Saltwater Living Resources. This chapter directs the state to preserve, manage and protect the marine, crustacean, shell and anadromous fishery resources in state waters; to protect and enhance the marine and estuarine environment; to regulate fishermen and vessels of the state engaged in the taking of such resources within or without state waters; to issue licenses for the taking and processing products of fisheries; to secure and maintain statistical records of the catch

of each such species; and, to conduct scientific, economic, and other studies and research.

Response: The proposed maintenance dredging would not have a substantial adverse impact on saltwater living resources. Benthic organisms may be adversely affected by the work, and may not fully recover due to the fact that dredging is performed on an annual basis. However, the project footprint is relatively small and lies adjacent to similar habitat. Therefore, substantial impacts to the aquatic ecosystem are not anticipated. Based on the overall impacts of the project, the project is consistent with the goals of this chapter.

11. Chapter 372, Living Land and Freshwater Resources. This chapter establishes the Fish and Wildlife Conservation Commission and directs it to manage freshwater aquatic life and wild animal life and their habitat to perpetuate a diversity of species with densities and distributions which provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits.

Response: The project would not have a substantial adverse impact on living land and freshwater resources. Use of the upland disposal sites would adversely impact wildlife, but these areas should be re-colonized as they are only periodically used.

12. Chapter 373, Water Resources. This chapter provides the authority to regulate the withdrawal, diversion, storage, and consumption of water.

Response: This project does not involve water resources as described by this chapter.

13. Chapter 376, Pollutant Spill Prevention and Control. This chapter regulates the transfer, storage, and transportation of pollutants and the cleanup of pollutant discharges.

Response: The contract specifications will prohibit the contractor from dumping oil, fuel, or hazardous wastes in the work area and will require that the contractor adopt safe and sanitary measures for the disposal of solid wastes. A spill prevention plan will be required.

14. Chapter 377, Oil and Gas Exploration and Production. This chapter authorizes the regulation of all phases of exploration, drilling, and production of oil, gas, and other petroleum products.

Response: This project does not involve the exploration, drilling or production of gas, oil or petroleum product and therefore, this chapter does not apply.

15. Chapter 380, Environmental Land and Water Management. This chapter establishes criteria and procedures to assure that local land development decisions consider the regional impact nature of proposed large-scale development. This chapter

also deals with the Area of Critical State Concern program and the Coastal Infrastructure Policy.

Response: The proposed maintenance dredging project shall be coordinated with the local regional planning commission. Therefore, the project shall be consistent with the goals of this chapter.

16. Chapters 381 (selected subsections on on-site sewage treatment and disposal systems) and 388 (Mosquito/Arthropod Control). Chapter 388 provides for a comprehensive approach for abatement or suppression of mosquitoes and other pest arthropods within the state.

Response: The project shall not further the propagation of mosquitoes or other pest arthropods.

17. Chapter 403, Environmental Control. This chapter authorizes the regulation of pollution of the air and waters of the state by the Florida Department of Environmental Regulation (now a part of the Florida Department of Environmental Protection).

Response: An Environmental Assessment addressing project impacts has been prepared and will be reviewed by the appropriate resource agencies including the Florida Department of Environmental Protection. Environmental protection measures will be implemented to ensure that no lasting adverse effects on water quality, air quality, or other environmental resources will occur. Water Quality Certification will be sought from the state prior to construction. The project complies with the intent of this chapter.

18. Chapter 582, Soil and Water Conservation. This chapter establishes policy for the conservation of the state soil and water through the Department of Agriculture. Land use policies will be evaluated in terms of their tendency to cause or contribute to soil erosion or to conserve, develop, and utilize soil and water resources both onsite or in adjoining properties affected by the project. Particular attention will be given to projects on or near agricultural lands.

Response: The proposed project is not located near or on agricultural lands; therefore, this chapter does not apply.

APPENDIX C - PERTINENT CORRESPONDENCE